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| EXAMINER | |
|---|---|
| LAVIN, CHRISTOPHER L | |
| **ART UNIT** | **PAPER NUMBER** |
| 2621 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/067,745 | IIDA ET AL. | |
| | Examiner | Art Unit | |
| | Christopher L Lavin | 2621 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30,34-36,39-41,44 and 50-59* is/are rejected.

7)☒ Claim(s) *31-33,37,38,42,43 and 45-49* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 – 30, 34 – 36, 39 – 41, 44, 50, 51, 53, 54, and 57 – 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (EP 1065642).

6. In regards to claim 1, Shimizu discloses a picture synthesizing apparatus, i.e., Parking Assist ECU, comprising (Figure 1, item 6): image pickup means, i.e., camera, disposed in a car (Figure 1, item 10); viewpoint change image synthesizing means for changing, i.e., modifying, a viewpoint of an image obtained by said image pickup means and synthesizing, i.e., adding traveling curve to, the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); car locus line generation means for generating at least one of a locus line at an arbitrary height of said car and a vertical, i.e., planes (rectangles), drawing and car locus line, i.e., traveling path curve, drawing means for line (col. 71, lines 16 – 21; col. 71, lines 29 – 33); the locus line generated by said car locus line generation means on, i.e., display, the image synthesized by said viewpoint change image synthesizing means (col. 71, lines 16 – 21; col. 71, lines 29 – 33).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one

having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

7. In regards to claim 2, The picture synthesizing apparatus according to claim wherein said car locus line generation means comprises three-dimensional locus line generation means, i.e., 3-, road surface projection means, and synthesized image projection means (col. 71, lines 16 – 21; col. 72, lines 55 – 57).

8. In regards to claim 3, The picture synthesizing apparatus according to claim 1 wherein said car locus line generation means generates a locus line in a case in which said car linearly advances (col. 71, lines 16 – 21:The travel path is created by locus lines.).

9. In regards to claim 4, The picture synthesizing apparatus according to claim 1, further comprising steering angle information output means for outputting a steering wheel angle of said car, wherein said car locus line generation means generates the locus line in accordance with steering angle information outputted by said steering angle information output means (col. 64, lines 36 – 39).

10. In regards to claim 5, The picture synthesizing apparatus according to claim 1 which has a function of interpolating a locus line on a road surface of said car and the locus line at the arbitrary height with a straight line or a curved line, and drawing a line vertical to said road surface on said synthesized image (col. 73, lines 5 – 7, col. 71 lines 29 – 33: The height of the planes are not specified, an arbitrary height could be used, i.e., bumper or height of car.).

11. In regards to claim 6, The picture synthesizing apparatus according to claim 1 which has a function of drawing a locus line of a bumper end of said car or a locus line of a car height on said synthesized image (col. 73, lines 5 –7).

12. In regards to claim 7, The picture synthesizing apparatus according to claim 1 which has a function of changing a color or a thickness of said locus line in accordance with a distance from said car and drawing the locus line (col. 71, lines 53 – 56: The color is changed at the distance that a collision might occur, which is changing color in accordance with a distance, i.e., the collision point).

13. In regards to claim 8, The picture synthesizing apparatus according to claim 4 which has a function of drawing a section of said car, i.e., the roof, moved apart from a rear end of said car along said locus line with an elapse of time on said synthesized image (col. 73, lines 5 – 7).

14. In regards to claim 9, The picture synthesizing apparatus according to claim 4 which has a function of drawing a solid diagram of said car moved apart from a rear end of said car along said locus line with an elapse of time on said synthesized image (col. 73, lines 5 – 7: The roof is a solid diagram of the car).

15. In regards to claim 10, The picture synthesizing apparatus according to claim 4 wherein said car locus line generation means comprises three-dimensional shape storage means, three-dimensional locus region generation means, i.e., Parking Assist ECU, road surface projection means, and synthesized image projection means, i.e., display (Figure 1, item 4 and item 6; col. 72, lines 3 – 7: To create a simulated car in the

image a three-dimensional model of the car must be stored, thus inherently a storage means must be provided. The remainder of this claim has been addressed above).

16. In regards to claim 11, The picture synthesizing apparatus according to claim 10 wherein said three-dimensional shape storage means stores a shape of said car (col. 72, lines 3 – 7).

17. In regards to claim 12, The picture synthesizing apparatus according to claim 10 wherein said three-dimensional shape storage means stores a shape of a rectangular parallelepiped inscribed by said car (col. 72, lines 50 – 54; col. 71, lines 29 – 32: The rectangles create a rectangular parallelepiped along the width lines. Combined these would represent the shape of the car.).

18. In regards to claim 13, The picture synthesizing apparatus according to claim 10 wherein said three-dimensional shape storage means stores a shape of a wheel of said car (col. 72, lines 3 – 7: A three-dimensional model of a car would need to include wheels).

19. In regards to claim 14, The picture synthesizing apparatus according to claim 10 wherein said three-dimensional shape storage means stores a shape of a bumper of said car (col. 72, lines 3 – 7: A three-dimensional model of a car would need to include a bumper.).

20. In regards to claim 15, The picture synthesizing apparatus according to claim 4, further comprising obstacle, i.e., obstructive object, collision prediction means for detecting an obstacle present around said car, and predicting a possibility of collision of said car with said obstacle (col. 71, lines 47 – 56).

21. In regards to claim 16, The picture synthesizing apparatus according to claim 15 wherein said car locus line drawing means does not draw the locus line of said car ahead of a collision place, when said obstacle collision prediction means predicts the collision of said car with said obstacle (col. 71, lines 47 – 49).

22. In regards to claim 17, The picture synthesizing apparatus according to claim 15 wherein said car locus line drawing means emphasizes and displays a collision place, when said obstacle collision prediction means predicts the collision of said car with said obstacle (col. 71, lines 53 – 56).

23. In regards to claim 18, The picture synthesizing apparatus according to claim 4, further comprising multi-screen generation means for displaying the image synthesized by said viewpoint change image synthesizing means in a multiplicity of divided screens (col. 68, lines 42 – 45).

24. In regards to claim 19, The picture synthesizing apparatus according to claim 18 wherein said car locus line drawing means draws a locus of the car in each screen generated by said multi-screen generation means (col. 68, lines 42 – 45, col. 68, lines 28 - 32: Locus generation has already been shown to be part of the drive assist, so the multi-screen generation means must also be able to generate locus lines to perform an effective drive assist).

25. In regards to claim 20, The picture synthesizing apparatus according to claim 18 wherein said image pickup means includes means for picking up an image behind said car, and means for picking up an image beside said car (col. 68, lines 33 – 41).

26. In regards to claim 21, The picture synthesizing apparatus according to claim 18 wherein said car locus line drawing means draws a locus line of a rear end of said car on an image beside said car, or an image obtained by converting said image beside the car (col. 65, lines 39 – 45: In a wide angle camera image of the back of a car and the side of the car will be obtained as well.).

27. In regards to claim 22, The picture synthesizing apparatus according to claim 19 wherein said car locus line drawing means draws the locus line or a car frame indicating the same position in the same color in different screens, when said locus line is drawn in a plurality of screens (col. 71, lines 53 – 56: Color is the same until a collision point, the plurality of screens has already been shown above).

28. In regards to claim 23, A picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in a car (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); auxiliary line, i.e., distance lines, generation means for generating an auxiliary line of an arbitrary position from said car (col. 72, lines 52 – 54); and auxiliary line drawing means for drawing the auxiliary line generated by said auxiliary line generation means on the image synthesized by said viewpoint change image synthesizing means (col. 72, lines 52 – 54).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide

for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

29. In regards to claim 24, The picture synthesizing apparatus according to claim 23, further comprising multi-screen generation means for displaying the image synthesized by said viewpoint change image synthesizing means in a multiplicity of divided screens, wherein said auxiliary line drawing means draws the generated auxiliary line in each screen generated by said multi-screen generation means (col. 68, lines 42 – 45, col. 68, lines 28 - 32: Auxiliary line generation has already been shown to be part of the drive assist, so the multi-screen generation means must also be able to generate Auxiliary lines to perform an effective drive assist.

30. In regards to claim 25, The picture synthesizing apparatus according to claim 23 wherein said auxiliary line generation means generates an auxiliary line indicating a position of a rear end of said car (col. 71, lines 29 – 33, figure 30: The 3-D rectangles created by the apparatus can be considered to consist of auxiliary lines. In step a7 the initial starting distance of the rectangles is set to 0, the zero point could be used to represent the rear end of the car in its current position).

31. In regards to claim 26, The picture synthesizing apparatus according to claim 23 wherein said auxiliary line generation means generates an auxiliary line indicating a

constant distance from a rear end of said car (col. 72, lines 52 – 54; Figure 44, items 343, 344, and 345).

32. In regards to claim 27, The picture synthesizing apparatus according to claim 23 wherein said auxiliary line generation means generates an auxiliary line indicating a width of a general car (col. 72, lines 50 – 54).

33. In regards to claim 28, A picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in a car so that a rear part of said car is positioned in a view field (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image including an image of said car (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); storage means for storing predetermined data beforehand (Figure 3, items 27, 28, and 29); and drawing means for superimposing predetermined auxiliary data upon the image synthesized by said viewpoint change image synthesizing means based on the data read from said storage means (col. 72, lines 50 – 54; col. 71, lines 29 – 33; Figure 3, items 27, 28, 29).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one

having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

34. In regards to claim 29, The picture synthesizing apparatus according to claim 28 which has a function of superimposing an auxiliary line upon a rear edge of said car, and providing an image emphasizing/indicating the corresponding position (col. 72, lines 50 – 54; col. 71, lines 29 – 33, figure 30: The 3-D rectangles created by the apparatus can be considered to consist of auxiliary lines. In step a7 the initial starting distance of the rectangles is set to 0, the zero point could be used to represent the rear edge of the car in its current position. A superimposed line would emphasize the position.).

35. In regards to claim 30, The picture synthesizing apparatus according to claim 28 which has a function of providing an image showing a three-dimensional illustration prepared as if the image of said car were picked up by an actually disposed image pickup unit and converted/synthesized (col. 73, 28 – 31).

36. In regards to claim 34, The picture synthesizing apparatus according to claim 28 which has a function of providing an image showing a mirror confirmation line behind a rear end of a bumper of said car by a constant distance and horizontally with said bumper (col. 67, 5 – 7, col. 72, 50 – 54; col. 71, lines 29 – 33, figure 30: The 3-D rectangles created by the apparatus can be considered to consist of auxiliary lines. In step a7 the initial starting distance of the rectangles is set to 0, the zero point could be used to represent the rear edge of the car in its current position. This edge can be used as a mirror line).

37. In regards to claim 35, The picture synthesizing apparatus according to claim 28 which has a function of providing an image including a road surface passage locus indicating a position obtained by projecting a position passed by a body end of said car onto a road surface, and a bumper end passage locus indicating a position passed by a bumper end of said car, when said car moves backwards, and a solid auxiliary line for connecting the loci to produce a solid sense (col. 73, lines 5 – 7; col. 72, lines 50 – 54; col. 71, lines 29 – 33: The 3-D rectangles created by the apparatus can be considered to consist of auxiliary lines contained within the guidelines, which represent the width of the car. Thus the rectangles can represent the bumper end passage locus at various points along the car's path.).

38. In regards to claim 36, The picture synthesizing apparatus according to claim 35 which has a function of providing an image showing said road surface passage locus like a tire trace, and indicating the bumper end passage locus connected to a bumper end of an actual image or an illustration of said car (col. 73, lines 5 – 7; col. 72, lines 50 – 54; col. 71, lines 29 – 33: It has previously been shown that locus lines, i.e., travel paths, are drawn. These locus lines represent the predicted tire positions of the car.).

39. In regards to claim 39, The picture synthesizing apparatus according to claim 35 which further comprises a locus calculation unit to calculate a predicted locus from a steering angle signal inputted from the outside, and which has a function of providing an image including a road surface passage locus corresponding to a steering angle of said car, a bumper end passage locus corresponding to the steering angle of said car, and a solid auxiliary line for connecting the loci to produce a solid sense (col. 72, lines 50 –

54; col. 71, lines 29 – 33; col. 64, lines 36 – 39: the rest of this claim has already been addressed above).

40. In regards to claim 40, The picture synthesizing apparatus according to claim 28 which has a function of providing an image simultaneously showing a road surface passage locus, a bumper end passage locus, a passage locus indicating a position passed by an appropriate height portion of a body of said car, and an illustration imitating a rear part of the car, when said car moves backwards (col. 73, lines 5 – 7; col. 72, lines 3 – 7; col. 72, lines 50 – 54; col. 71, lines 29 – 33: Shimizu discloses a picture synthesizing apparatus, which has previously been shown to have road surface passage loci. Shimizu discloses a passage locus indicating a position passed by an appropriate height portion of the car. Shimizu discloses simulating a car; this simulated car would include the rear part of the car. The 3-D rectangles created by the apparatus can be considered to consist of auxiliary lines contained within the guidelines, which represent the width of the car. Thus the rectangles can represent the bumper end passage locus at various points along the car's path.).

41. In regards to claim 41, The picture synthesizing apparatus according to claim 40 which has a function of providing an image showing said road surface passage locus like a tire trace, and indicating said bumper end passage locus connected to a bumper end of an actual image or an illustration (col. 73, lines 5 – 7; col. 72, lines 50 – 54; col. 71, lines 29 – 33: It has previously been shown that locus lines, i.e., travel paths, are drawn. These locus lines represent the predicted tire positions of the car.).

42. In regards to claim 44, The picture synthesizing apparatus according to claim 40 which further comprises a locus calculation unit to calculate a predicted locus from a steering angle signal inputted from the outside, and which has a function of providing an image simultaneously showing said road surface passage locus corresponding to a steering angle of said car, said bumper end passage locus corresponding to the steering angle of said car, a passage locus indicating a position passed by an appropriate height portion of a body of said car, and an illustration imitating a rear part of said car (col. 73, line 5 – 7; col. 72, lines 50 – 54; col. 71, lines 29 – 33; col. 64, lines 36 – 39: the rest of this claim has already been addressed above).

43. In regards to claim 50, An image synthesis/display apparatus comprising: a picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in a car (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); car locus line generation means for generating at least one of a locus line at an arbitrary height of said car and a vertical line (col. 71, lines 16 – 21; col. 71, lines 29 – 33); and car locus line drawing means for drawing the locus line generated by said car locus line generation means on the image synthesized by said viewpoint change image synthesizing means (col. 71, lines 16 – 21; col. 71, lines 29 – 33); display means for displaying the image synthesized by said picture synthesizing apparatus (Figure 1, item 4); and display data conversion means for converting said image to be displayed into data suitable for said display means (Figure 3, items 33 and 34).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

44. In regards to claim 51, An image synthesis/display apparatus comprising: a picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in a car (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); auxiliary line generation means for generating an auxiliary line of an arbitrary position from said car (col. 72, lines 52 – 54); and auxiliary line drawing means for drawing the auxiliary line generated by said auxiliary line generation means on the image synthesized by said viewpoint change image synthesizing means (col. 72, lines 52 – 54); display means for displaying the image synthesized by said picture synthesizing apparatus (Figure 1, item 4); and display data conversion means for converting said image to be displayed into data suitable for said display means (Figure 3, items 33 and 34).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

45. In regards to claim 53, An image acquirement warning apparatus comprising: detection means for detecting an approaching state of a connection object connected to a car (col. 71, lines 47 – 56); a picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in said car and/or said connection object (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); car locus line generation means for generating at least one of a locus line at an arbitrary height of said car and a vertical line (col. 71, lines 16 – 21; col. 71, lines 29 – 33); and car locus line drawing means for drawing the locus line generated by said car locus line generation means on the image synthesized by said viewpoint change image synthesizing means (col. 71, lines 16 – 21; col. 71, lines 29 – 33); and warning means for generating a warning signal from said approaching state obtained by said detection means and/or a relation between said car

and said connection object in the image synthesized by said picture synthesizing apparatus (col. 71, lines 46 – 56).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

46. In regards to claim 54, An image acquirement warning apparatus comprising: detection means for detecting an approaching state of a connection object connected to a car (col. 71, lines 47 – 56); a picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in said car and/or said connection object (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); auxiliary line generation means for generating an auxiliary line of an arbitrary position from said car (col. 72, lines 52 – 54); and auxiliary line drawing means for drawing the auxiliary line generated by said auxiliary line generation means on the image synthesized by said viewpoint change image synthesizing means (col. 72, lines 52 – 54); and warning means for generating a warning signal from said approaching state obtained by said detection means and/or a

relation between said car and said connection object in the image synthesized by said picture synthesizing apparatus (col. 71, lines 46 – 56).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

47. In regards to claim 57, A car position recognition apparatus comprising: a picture synthesizing apparatus comprising (Figure 1, item 6): a plurality of image pickup means disposed in a car, and including rear image pickup means for picking up an image behind said car (col. 68, lines 42 – 46; Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); car locus line generation means for generating at least one of a locus line at an arbitrary height of said car and a vertical line (col. 71, lines 16 – 21; col. 71, lines 29 – 33); and car locus line drawing means for drawing the locus line generated by said car locus line generation means on the image synthesized by said viewpoint change image synthesizing means (col. 71, lines 16 – 21; col. 71, lines 29 – 33); image detection means for detecting an image of an arbitrary object from the image obtained

by said rear image pickup means or the image synthesized by said picture synthesizing apparatus (col. 71, lines 46 – 56: The apparatus must be able to detect the obstruction to alert the driver of the obstruction); recognition means for recognizing a position relation between the image detected by said image detection means and the image of said car (col. 71, lines 46 – 56: The changing colors of the planes at the obstacle the apparatus must recognize the position relations); and comparison means for comparing said position relation recognized by said recognition means with a predetermined position relation, i.e., distance lines, and detecting a deviation amount between the position relations from the position relations (col. 72, lines 50 – 57: The distance lines can show the distance to the obstruction).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

48. In regards to claim 58, A car position recognition apparatus comprising: a picture synthesizing apparatus comprising (Figure 1, item 6): a plurality of image pickup means disposed in a car, and including rear image pickup means for picking up an image behind said car (col. 68, lines 42 – 46; Figure 1, item 10); viewpoint change image

synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); auxiliary line generation means for generating an auxiliary line of an arbitrary position from said car (col. 72, lines 52 – 54); and auxiliary line drawing means for drawing the auxiliary line generated by said auxiliary line generation means on the image synthesized by said viewpoint change image synthesizing means (col. 72, lines 52 – 54); image detection means for detecting an image of an arbitrary object from the image obtained by said rear image pickup means or the image synthesized by said picture synthesizing apparatus (col. 71, lines 46 – 56); recognition means for recognizing a position relation between the image detected by said image detection means and the image of said car (col. 71, lines 46 – 56); and comparison means for comparing said position relation recognized by said recognition means with a predetermined position relation, and detecting a deviation amount between the position relations from the position relations (col. 72, lines 50 – 57).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

49. Claims 52, 55, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Okamoto ("The Principle of virtual viewpoint image synthesis using a road surface model", the 71 ITS International Conference, 2000).

50. In regards to claim 52, Shimizu discloses An image synthesis/display apparatus comprising: a picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in a car (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image including an image of said car (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); storage means for storing predetermined data beforehand (Figure 3, items 27 – 29); and drawing means for superimposing predetermined auxiliary data upon the image synthesized by said viewpoint change image synthesizing means based on the data read from said storage means (col. 72, lines 52 – 54); display means for displaying the image synthesized by said picture synthesizing apparatus (Figure 1, item 4); and display data conversion means for converting said image to be displayed into data suitable for said display means (Figure 3, items 33 and 34).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one

having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

Shimizu further does not disclose that the image pickup means is disposed to show the rear part of the car. Changing the angle of a camera disposed in the rear of a car is an obvious modification.

Okamoto teaches of a parking assistance system using a virtual viewpoint image synthesis. In figure 4.b Okamoto shows that the rear of the car is shown in the virtual viewpoint, in order to include the rear part of the car the camera angle would need to include the rear part of the car.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to reposition the camera to include the rear part of the car. By doing so the user can get a better idea of how far away from a collision point the car is.

51. In regards to claim 55, An image acquirement warning apparatus comprising: detection means for detecting an approaching state of a connection object connected to a car (col. 71, lines 47 – 56); a picture synthesizing apparatus comprising (Figure 1, item 6): image pickup means disposed in said car and/or said connection object (Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image including an image of said car (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); storage means for storing predetermined data beforehand (Figure 3, items 27 – 29); and drawing means for superimposing predetermined auxiliary data upon the image synthesized by said viewpoint change image synthesizing means based on the data

read from said storage means (col. 72, lines 52 – 54); and warning means for generating a warning signal from said approaching state obtained by said detection means and/or a relation between said car and said connection object in the image synthesized by said picture synthesizing apparatus (col. 71, lines 46 – 56).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

Shimizu further does not disclose that the image pickup means is disposed to show the rear part of the car. Changing the angle of a camera disposed in the rear of a car is an obvious modification.

Okamoto teaches of a parking assistance system using a virtual viewpoint image synthesis. In figure 4.b Okamoto shows that the rear of the car is shown in the virtual viewpoint, in order to include the rear part of the car the camera angle would need to include the rear part of the car.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to reposition the camera to include the rear part of the car. By doing so the user can get a better idea of how far away from a collision point the car is.

52. In regards to claim 59, A car position recognition apparatus comprising: a picture synthesizing apparatus comprising (Figure 1, item 6): a plurality of image pickup means disposed in a car, including rear image pickup means for picking up an image behind said car (col. 68, lines 42 – 46; Figure 1, item 10); viewpoint change image synthesizing means for changing a viewpoint of an image obtained by said image pickup means and synthesizing the image including an image of said car (col. 71, lines 5 – 8; col. 72, lines 3 – 7; col. 71, lines 16 – 21); storage means for storing predetermined data beforehand (Figure 3, items 27 – 29); and drawing means for superimposing predetermined auxiliary data upon the image synthesized by said viewpoint change image synthesizing means based on the data read from said storage means (col. 72, lines 52 – 54); image detection means for detecting an image of an arbitrary object from the image obtained by said rear image pickup means or the image synthesized by said picture synthesizing apparatus (col. 71, lines 46 – 56); recognition means for recognizing a position relation between the image detected by said image detection means and the image of said car (col. 71, lines 46 – 56); and comparison means for comparing said position relation recognized by said recognition means with a predetermined position relation, and detecting a deviation amount between the position relations from the position relations (col. 72, lines 50 – 57).

Shimizu discloses changing the viewpoint in several different fashions, as shown above, however Shimizu does not specify that after changing the viewpoint the image is further modified. However changing the viewpoint alone would not adequately provide for parking assistance. With a viewpoint change, where the image is often likely to

include distortions, guidelines provide the user with a better sense of the space, size, and orientation (col. 38, lines 32 – 34). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to further modify the image created by Shimizu after a viewpoint change to include guidelines.

Shimizu further does not disclose that the image pickup means is disposed to show the rear part of the car. Changing the angle of a camera disposed in the rear of a car is an obvious modification.

Okamoto teaches of a parking assistance system using a virtual viewpoint image synthesis. In figure 4.b Okamoto shows that the rear of the car is shown in the virtual viewpoint, in order to include the rear part of the car the camera angle would need to include the rear part of the car.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to reposition the camera to include the rear part of the car. By doing so the user can get a better idea of how far away from a collision point the car is.

53. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Williams (5,109,213).

54. In regards to claim 56, Shimizu discloses in col. 71, lines 46 – 56 a warming system. However Shimizu does not disclose user set conditions for generating a warning signal.

Williams teaches in col. 3, lines 61 – 64 that a warning system in the automotive industry can be provided with user customized settings to control warnings.

Therefore it would be obvious to one having ordinary skill in the art at the time of the invention to include user controlled warning settings as taught by Williams in the image acquirement warning apparatus disclosed by Shimizu. Letting the user control warning settings would be useful, as some users might want to increase the distance to an obstacle at which a warning is issued. This will allow users to setting the warnings at a level that will make the user comfortable.

***Allowable Subject Matter***

55. Claims 31 – 33, 37, 38, 42, 43, and 45 – 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

56. The following is a statement of reasons for the indication of allowable subject matter:

57. In regards to claim 31,the art of record does not teach nor does it suggest the specific features called for in the claims, particularly explicitly indicating a tire on the image along with the other claimed features.

58. In regards to claim 32, the art of record does not teach nor does it suggest the specific features called for in the claims, particularly using an actual image of the car is in the synthesized image along with the other claimed features.

59. In regards to claim 33, the art of record does not teach nor does it suggest the specific features called for in the claims, particularly superimposing two wall surfaces representing the width of the car along with the other claimed features.

60. In regards to claims 37 and 38, the art of record does not teach nor does it suggest the specific features called for in the claims, particularly, explicitly indicating a tire on the image along with the other claimed features.

61. In regards to claims 42 and 43, the art of record does not teach nor does it suggest the specific features called for in the claims, particularly, explicitly indicating a tire on the image along with the other claimed features.

62. In regards to claims 45 – 49, the art of record does not teach nor does it suggest the specific features called for in the claims, particularly creating both an upper and a lower bumper surface passage locus along with the other claimed features.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L Lavin whose telephone number is 703-306-4220. The examiner can normally be reached on M - F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLL

DANIEL MIRIAM
PRIMARY EXAMINER